Supporting Information for:

"Eruptive modes and cessation of volcanism at West Mata seamount, NE Lau basin: 1996-2012"

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Supporting Information Descriptions

Introduction

The Supporting Information files contain details of some of the data sets used in this study.

1.0 Text S1_README - Readme describing supporting information

2.0 Text S2 – Multibeam bathymetry processing and analysis; Figure captions for Figures S1, S2, S3.

3.0 Text S3 - Description of ^{210}Po dating methods presented in Table 3

4.0 Table S1 - Multibeam bathymetry data files and processing methods used in Figures 1-3 and Figures 5-9

4.1 Column "Month/Year" Month and year that survey was conducted

4.2 Column "Vessel" Research vessel survey conducted by

4.3 Column "Cruise ID" Identifier for expedition

4.4 Column "Data Processing" Comments on methods used in processing data files

5.0 Table S2 - CTDO data files used in Figure 11b and 11c provided in six worksheets signified by numbered tabs correspond to station numbers. Data files T08C-17, T10B-06, V10C-01 and T12A-03 have the following format (see 5.9 regarding the format for data files V09C-01 and V09C-05)

5.1 Column "Depth (m)" Depth in meters

5.2 Column "PSU" Practical salinity units

5.3 Column "Pot Temp (°C)" Potential temperature of a parcel of fluid at pressure = 0 in degrees centigrade

5.4 Column "Pot Dens" Potential density in kg/m^3

5.5 Column “dNTU” Delta nephelometric turbidity units above background as described in section 2.2 of paper

5.6 Column “Relative ORP (mv)” Oxidation reduction potential in relative units of millivolts as described in section 2.2 of paper

5.7 Column “Longitude” Longitude in decimal degrees of station – southern hemisphere

5.8 Column “Latitude” Latitude in decimal degrees of station – western hemisphere

5.9 Note for CTDO sensor data for casts V09C-01 and V09C-05:
Table for V09C-01 has depth (m), Relative ORP (mv), Longitude and Latitude columns. Table for Cast V09C-05 has Transmissomter values (V) and converted dNTU values. Instrument failures in 2009 necessitated using a transmissometer rather than a light-backscatter sensor on cast V09C-05; those values were converted to ΔNTU. The absence of ORP data on V09C-05 necessitated substituting an ORP maximum value from V09C-01, also over the West Mata summit.

6.0 Table S3 - Helium isotope and Hydrogen values at West Mata 2008 – 2012, used in Figure 11d

6.1 Column “sample” CTD station number as in Figure. 11b and bottle number

6.2 Column “[^{3}He] ccSTP/g” Cubic centimeters at standard temperature and pressure of ^{3}He per gram

6.3 Column “[^{4}He] ccSTP/g” Cubic centimeters at standard temperature and pressure of ^{4}He per gram

6.4 Column “Station” Station number as in 3.1

6.5 Column “Bottle” Bottle number on CTD Niskin bottle rosette sample taken from

6.6 Column “Depth (m)” Depth in meters

6.7 Column “H_2 nM/kg” Hydrogen value in nanomoles

6.8 Column “δ(^{3}He)%” Helium isotope value as described in section 2.2 of paper

7.0 Table S4 - ^{210}Po analyses of lava sample aliquots and analysis metadata, used to calculate ages of samples used in Figure 9 and Table 3

7.1 Column A is the sample identifier

7.2 Column B is the International GeoSample Number registered at www.geosamples.org.

7.3 Column C is the sample collection date

7.4 Column D is the ^{210}Po analysis aliquot number

7.5 Column E is the date the ^{210}Po aliquot analysis began

7.6 Column F is the alpha particle detector in the SOEST Isotope Lab used for that analysis

7.7 Column G is the amount of sample dissolved for analysis

7.8 Column H is the amount of ^{209}Po spike added to the sample after dissolution.

7.9 Column I is the fraction of the total sample used for that aliquot analysis.

7.10 Column J is the mass fraction of sample in that aliquot

7.11 Column K is the mass fraction of spike in that aliquot

7.12 Column L is the measured ^{210}Po activity in that aliquot

7.13 Column M is the 1 sigma error on the ^{210}Po activity in that aliquot

8.0 Figure S1: Slope maps derived from bathymetric data, overlaid with bathymetric contours and depth difference polygons. See Text S2 for complete figure caption.

9.0 Figure S2: Bathymetric soundings, ship tracklines and speed information for the surveys and areas shown in Figure S1. Yellow polygons, also the same as in Figure 3 and Figure S1, indicate areas of depth changes that occurred over the period. For example, depth changes shown of Figure S2b occurred sometime between 06/96 and 11/08 (PI). Black dots show the individual bathymetry soundings, which are the beams on each ping. Red lines and arrows indicate the ship track and direction, respectively. Speeds are at the arrow location, although they vary within a data file. See Text S2 for complete figure caption.

10.0 Figure S3: Bathymetric soundings, ship tracklines and speed information for the surveys differenced that depicted the depth changes between 5/10 and 11/11 (PIV+PV) on the WSWRZ deep eruptives and changes between 12/10 and 11/11 (PV) at and near the summit. See Text S2 for complete figure caption.